

ABSTRACT OF THE DISCLOSURE

An ellipsometer, and a method of ellipsometry, for analyzing a sample using a broad range of wavelengths, includes a light source for generating a beam of polychromatic light having a range of wavelengths of light for interacting with the sample. A polarizer polarizes the light beam before the light beam interacts with the sample. A rotating compensator induces phase retardations of a polarization state of the light beam wherein the range of wavelengths and the compensator are selected such that at least a first phase retardation value is induced that is within a primary range of effective retardations of substantially 135° to 225° , and at least a second phase retardation value is induced that is outside of the primary range. An analyzer interacts with the light beam after the light beam interacts with the sample. A detector measures the intensity of light after interacting with the analyzer as a function of compensator angle and of wavelength, preferably at all wavelengths simultaneously. A processor determines the polarization state of the beam as it impinges the analyzer from the light intensities measured by the detector.